

## CLAIMS

1. A central station for receiving data from a plurality of outstations, the central station being configured to execute, in use, a compensation procedure for compensating for  
5 degradation of data from the outstations, the compensation procedure having at least one adjustable characteristic governed by a parameter set, wherein the compensation procedure includes the steps of: (i) compensating data from an outstation using different starting parameter sets; (ii) measuring the quality of the data compensated using the different starting parameter sets; and, (iii) in dependence on the measured quality,  
10 selecting a starting parameter set for compensating subsequent arriving data from that outstation.
2. A central station according to claim 1, wherein the central station is configured to store a parameter set in respect of each outstation.  
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3. A central station according to claim 2, wherein the stored parameter set is selected for each outstation according to steps (i) to (iii).
4. A central station according to any of the preceding claims, wherein steps (i) to (iii) are  
20 performed in response to the receipt of data from a newly connected outstation.
5. A central station according to any of the preceding claims, wherein a parameter set is selected from other starting parameter sets by comparing the quality achieved with the different sets.  
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6. A central station according to any of the preceding claims, wherein test data from an outstation is used to evaluate starting parameter sets, a copy of the test data being stored at the central station, preferably in advance of the arrival of the test data from an outstation.  
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7. A central station according to any of the preceding claims, wherein the parameter sets each include a plurality of parameters.
8. A central station according to any of the preceding claims, wherein the central station is  
35 configured for receiving data from the outstations across an optical network.

9. A central station according to any of the preceding claims, wherein the compensation procedure is executed in the electrical domain.
- 5 10. A central station according to any of the preceding claims, wherein the compensation procedure includes the steps of: sampling a stream of data from an outstation at a plurality of time positions within the stream; and, performing a respective function on each sample.
- 10 11. A central station according to any of the preceding claims, wherein the central station is configured to transmit a scheduling instruction to an outstation in order to receive data from that outstation, which scheduling instruction contains a command for allowing that outstation to transmit data for a specified time.
- 15 12. A central station according to claim 11, wherein the central station is configured to transmit a further scheduling instruction in order to allow further data to be transmitted if such further data is required.
- 20 13. A central station according to claim 11 or claim 12, wherein the parameter set used when applying the compensation procedure to incoming data is chosen in dependence on a stored scheduling instruction.
- 25 14. A central station according to any of claims 11 to 13, wherein the scheduling instructions contain an identifier identifying the outstation from which data is allowed, and wherein the identifier is used to retrieve the parameter set associated with the identified outstation.
- 30 15. A central station according to any of the preceding claims, wherein the compensation procedure includes an adaptive algorithm, the adaptive algorithm being configured such that when data from an outstation is received, the values of the parameters for that outstation are improved, relative to a set of initial values, using said received data.
- 35 16. A central station according to claim 15, wherein the central station is configured such that when the origin of arriving data changes from a first outstation to a second outstation, the central station: (i) stores, for later retrieval, the improved values of the parameters in respect of data from the first outstation; (ii) retrieves previously stored parameters in

respect of the second outstation; (iii) in response to expected or arriving further data from the first outstation, retrieves previously improved values of the parameters in respect of the first outstation; (iv), and, preferably, further improves the parameters for the first outstation.

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17. A method of operating a communications system including a central station and a plurality of outstations connected to the central station, the central station being operable to execute a compensation procedure for compensating for degradation of data from the outstations, the compensation procedure having at least one adjustable characteristic  
10 governed by a parameter set, the method including the steps of: (i) compensating data from an outstation using different starting parameter sets; (ii) measuring the quality of the data compensated using the different starting parameter sets; and, (iii) in dependence on the measured quality, selecting a starting parameter set for compensating subsequent arriving data from that outstation.

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18. A method as claimed in claim 17, wherein the communications system includes an optical network for connecting the central station to the outstations.

19. A method as claimed in claim 17 or claim 18, wherein the optical network includes a  
20 branch junction for channelling signals from at least two outstations onto a common optical carrier, the outstations being configured to transmit data at intervals such that in use the transmitted data from the outstations is passively time division multiplexed.

20. A method as claimed in any of claims 17 to 19, wherein the central station stores  
25 predetermined data, and the or each outstation stores corresponding predetermined data, and wherein the or each outstation transmits its predetermined data to the central station, such that the predetermined data stored at the central station can be compared with the received predetermined data.

30 21. A method as claimed in claim 20, wherein the stored predetermined data and the received predetermined data is compared in order to measure the quality of the data compensated using the different starting parameter sets.

22. A method claimed in claim 20 or claim 21, wherein the predetermined data stored at  
35 an outstation and that stored at the central station include at least some data in common.

23. A communications system including a central station and a plurality of outstations, the central station being configured to execute a compensation procedure for compensating for degradation of data from the outstations, the compensation procedure having at least
- 5 one adjustable characteristic governed by a parameter set, wherein the central station stores at least one parameter set in respect of each outstation and, for each outstation, applies the compensation algorithm to data from an outstation using the parameter set associated with that outstation.